China Sea the morning of the 16th, close to and west of the coast of Luzon. It was a very small center, within 70 miles of the coast, as the observations taken on board the S. S. *Anking* show. This ship, en route to Manila, followed the one hundred and nineteenth meridian very closely and yet passed west of the typhoon on the afternoon of the 17th. The next day, the typhoon was over the western part of the Balintang Channel, where it changed its course to the northeast, filling up over the Nansei (Loochoos) Islands, November 19.

At Legaspi, the minimum reading of the barometer was 723.45 millimeters (28.482 inches); at Naga, 728.87 millimeters (28.695 inches). The rains which this typhoon brought caused many deaths in and around the town of Mauban, Tayabas Province. Seventeen hours of rain over the sources of the Mauban River caused a sudden and destructive flood, which took a toll of 52 lives. The province of Tayabas suffered heavily and, on November 24, the Governor released the report that 106 lives were lost because of this typhoon.

Typhoon, November 24 to December 3.—This typhoon first appeared on the weather map of November 24, 2 p. m., located about 500 miles southeast of Guam. It moved west-northwest and then was almost stationary, November 25 and 26, over the regions about 300 miles south-southwest of Guam. Taking a more westerly course, it approached the island of Yap November 27, passing that island on a west by south course early in the forenoon of the same day. Moving very fast on a west by north course, it approached the Visayan Islands, being located on November 28 near latitude 10° N., longitude 131° E. November 29, at 6 a. m., it was close to and south of Tacloban, Leyte Province, now changing to a west-northwest course. Crossing the Visayan Islands, it moved southwest of Masbate, north of Capiz, close to and south of Odiongon. The next morning, (Nov. 30) it was over northern Mindoro. It continued its west-northwest course into the China Sea for 2 days. On December 2, it changed its course more to the west and filled up over the Paracel Islands the next day.

This storm was the cause of much destruction to crops and light-material houses; little loss of life was reported, except the case of the sinking of the M. S. *Pulupandan* which was lost off Pandan, Antique Province, about 6:30 p. m. November 29. Of the crew of 28, 7 were saved, according to the newspapers of December 5.

Of the stations reporting, Guiuan, Samar Province, reported the lowest barometric minimum, 724.80 millimeters (28.535 inches). Tacloban, Leyte Province reported 727.24 millimeters (28.631 inches).

TYPHOONS AND DEPRESSIONS IN THE FAR EAST, DECEMBER 1934

BERNARD F. DOUCETTE, S. J.

[Weather Bureau, Manila, P. I.]

Four typhoons and 1 depression, 2 of which were exceptional because of their courses, occurred during the month. We shall consider these in chronological order.

Typhoon, November 30 to December 6.—The approximate positions of this typhoon, day by day, were:

November 30, 6 a. m., latitude 8° N., longitude 142°30′ E.
December 1, 6 a. m., latitude 8°30′ N., longitude 135° E.
December 2, 6 a. m., latitude 12° N., longitude 128°30′ E.
December 3, 6 a. m., latitude 15°30′ N., longitude 124°30′ E.
December 4, 6 a. m., latitude 21°30′ N., longitude 129° E.
December 5, 6 a. m., latitude 26°30′ N., longitude 137° E.
December 6, 6 a. m., latitude 30° N., longitude 141° E.

This typhoon was severe. As it passed Yap, about 60 miles to the south, a barometric minimum of 742.3 millimeters (29.22 inches), was recorded, together with winds of force 9 from the east. On December 3, about 200 miles east of Luzon, it caused destructive rains in the Cagayan River Valley (northern Luzon). Also, on December 4 and 5, the northerly winds on the western side of the typhoon reinforced the circulation around the high-pressure area over China to such an extent that strong northeast monsoon winds extended as far as Singapore. The path of this typhoon was unusual for the time of year. The usual course of typhoons during the late months of the year is across the archipelago, so that one which recurves to the northeast is considered exceptional. It was very fortunate for the Philippines that this typhoon recurved and did not pass over any part of the Islands.

Typhoon, December 3 to 7.—This typhoon formed in the China Sea and moved eastward, decreasing in intensity as it crossed the archipelago. The daily positions are given below:

December 3, 6 a. m., latitude 10° N., long tude 116°30′ E.
December 4, 6 a. m., latitude 11° N., longitude 119° E.
December 5, 6 a. m., latitude 11° N., longitude 122° E.
December 6, 6 a. m., latitude 11° N., longitude 129° E.
December 7, 6 a. m., latitude 12° N., longitude 134° E.

Regarding the formation of this typhoon, there are two possibilities. The typhoon of November 24 to December 3 (briefly described in the typhoons of November 1934) was in the China Sea close to the same region where the present typhoon appeared. There were at the time northeast monsoon winds of considerable intensity over the China Sea, so the typhoon could not move very far on a westerly course; there is no definite evidence that it filled up, and so it is possible that it moved southward and appeared in the China Sea west of Palawan Island, centered in the position given above. On the other hand, from observations at Puerto Princesa, Palawan Island, and also observations taken on board the S. S. *Fathomer*, then in port at an island at the southern portion of the Palawan group, it seems to have been a new typhoon. It was considered merely a low-pressure area until the S. S. *Halili* sent observations which definitely proved that it was a typhoon. Its eastward course was not rapid, and, fortunately it decreased in intensity as it moved. It caused great destruction in the town of Bacuit, Palawan Province. Its path across the Visayan Islands was along a well-defined front, between the northeast monsoon and the southwest monsoon, as it is called. The surface and cloud observations from the stations in the Philippines together with pilot balloon reports received by radio from Singapore and Alor Star gave clear evidence of the existence of this front. The typhoon moved with the warmer current of air.

A few words concerning the general situation during these days might be of interest. From November 20 on, the high pressure over China became stronger, then weaker, then stronger, Then the typhoon of November 24 to December 3 formed and moved across the archipelago. Following it was the very severe typhoon described above, which, however, recurved. When it reached the ocean area east of northern Luzon and Formosa, it caused the northeast monsoon to intensify. In the China Sea, this prevented the typhoon which had just crossed the Visayan Islands (Nov. 29 and 30) from moving in a westerly direction. It moved more slowly and seemed to be filling up. Then, a typhoon appeared west of northern Palawan (Dec. 3, lat. 10°, long. 116°30′) and began to move in an easterly direction. In advance of it was the well-defined front, and its course was practically that of the boundary between the two wind systems. When this typhoon moved into the Pacific Ocean,

the northeast monsoon prevailed over the whole archipelago.

Typhoon, December 4 to 7.—This typhoon formed so far to the east of the Philippines and moved in such a way that it had no effect upon the weather of the archipelago The approximate daily positions are given below:

December 4, 6 a. m., latitude 10° N., longitude 144° E.
December 5, 6 a. m., latitude 15° N., longitude 140° E.
December 6, 6 a. m., latitude 22° N., longitude 140° E.
December 7, 6 a. m., latitude 26° N., longitude 147° E.

Typhoon, December 12 to 18.—Forming southwest of Palau Island, this disturbance moved toward the archipelago as a depression, increasing in intensity as it moved. It was strong enough on December 13 and 14 to be called a typhoon, and then it weakened and slowly filled up. The positions of this typhoon are given below:

December 12, 6 a. m., latitude 5° N., longitude 133° E.
December 13, 6 a. m., latitude 8°20′ N., longitude 129°30′ E.
December 14, 6 a. m., latitude 10° N., longitude 125° E.
December 15, 6 a. m., latitude 10°30′ N., longitude 123° E.
December 16, 6 a. m., latitude 12°20′ N., longitude 122°30′ E.
December 17, 6 a. m., latitude 12°20′ N., longitude 121°30′ E.
December 18, 6 a. m., latitude 11°30′ N., longitude 117° E.

Depression, December 16 to 19.—This depression formed southwest of Yap and moved toward the Philippines, but lost what little energy it had before reaching the archipelago. Its approximate positions are given below:

December 16, 6 a. m., latitude 7° N., longitude 137° E.
December 17, 6 a. m., latitude 8° 30′ N., longitude 135°30′ E.
December 18, 6 a. m., latitude 10° N., longitude 132° E.
December 19, 6 a. m., latitude 10°20′ N., longitude 130°30′ E.

GALE IN THE RED SEA, NOVEMBER 1934

In the meteorological report received at the Weather Bureau from the British S. S. *Ramsay*, Capt. W. Shaw Hickman, master, Second Officer R. S. McLean, observer, is a description of a violent gale experienced on November 18, 1934, while northbound in the Red Sea. The ship at midnight (17th–18th) was in latitude 23°12′ N., longitude 36°48′ E., wind east-southeast, force 4, barometer 29.98 inches (uncorrected). At 1:15 a.m. the wind suddenly shifted to north-northeast, force 9, accompanied by heavy rain and thunder. At 2 a.m. the wind force rose to 10, with barometer steady at 29.98.

After 1:15 a.m., according to Mr. McLean, "the sea rose very quickly and the steamer commenced shipping water fore and aft, while spraying over all. At times heavy spray was thrown clear over top of chart room on top of bridge. The lookout man had to leave the forecastle head and take up position on the bridge, it being dangerous forward on account of sea rising so rapidly." By 2:10 a. m. the wind had decreased to northeast, force 4.

The observing officer referred to the stormy conditions as of exceptional character; and also drew attention to a thunderstorm experienced 12 hours previously, on the 17th, in which the wind, which was from a northerly direction, force 2, at noon "shifted suddenly with one leap" to south-southwest, force 6, at 1:35 p.m.

The two instances were mentioned as squalls extraordinary to this region, and moving in diametrically opposite directions. The pressure throughout remained at 29.98 inches.—W. E. H.

CLIMATOLOGICAL TABLES

CONDENSED CLIMATOLOGICAL SUMMARY

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

Condensed climatological summary of temperature and precipitation by sections, December 1934

[For description of tables and charts, see Review, January, p. 37]

Section	Temperature								Precipitation					
			Monthly extremes								Greatest monthly		Least monthly	
	Section average	Departure from the normal	Station	Highest	Date	Station	Lowest	Date	Section average	Departure from the normal	Station	Amount	Station	Amount
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	46.7	−0.9	Pushmataha	80	30	Valley Head	10	12	3.41	−1.51	Milltown	6.76	Valley Head	1.83
Arizona	46.8	+2.3	Marinette	85	11	2 stations	0	3	1.71	+.51	Crown King	4.18	Gila Bend	.11
Arkansas	41.5	−1.2	Portland	74	24	Dutton	4	11	3.78	−.51	England	6.85	Bentonville	.95
California	46.3	+.7	2 stations	83	[1] 10	Sierraville	−12	31	3.20	−.50	Crescent City (near)	13.53	Brawley	.09
Colorado	28.9	+3.5	Two Buttes	79	22	Fraser	−24	4	.60	−.31	Columbine	3.13	6 stations	.00
Florida	60.0	.0	Lake Placid	90	[1] 3	2 stations	16	12	1.00	−1.76	Pensacola	2.56	Everglades	.00
Georgia	46.9	−1.2	2 stations	82	[1] 3	3 stations	10	12	2.64	−1.62	Fort Gaines	6.02	Waycross	.88
Idaho	27.7	+1.8	Lewiston	62	19	Deadwood	−17	1	2.03	+.05	Roland	9.78	Challis	.09
Illinois	28.3	−2.2	Du Quoin	59	4	Sycamore	−9	27	1.74	−.52	Cairo	3.30	Warsaw	.66
Indiana	29.9	−2.4	Shoals	60	2	Fowler	−12	27	2.00	−.88	Scottsburg	3.81	Shoals	1.08
Iowa	21.5	−2.4	Sioux City	48	22	4 stations	−17	[1] 11	.57	−.62	Clinton	2.01	Mt. Ayr	T
Kansas	33.1	+.3	Liberal	72	28	Hanover	−5	7	.42	−.44	Eldorado	1.35	2 stations	.00
Kentucky	37.0	−.9	Middlesboro	69	1	Anchorage	5	12	2.18	−1.80	Lovelaceville	4.22	Whitesburg	.83
Louisiana	52.8	+.4	2 stations	82	[1] 30	2 stations	14	12	3.91	−1.47	Dodson	7.69	Jonesville	1.91
Maryland-Delaware	35.2	−.2	do	71	1	Oakland, Md	−16	11	2.75	−.40	State Sanatorium, Md.	4.71	Western Port, Md	1.59
Michigan	23.4	−1.8	Webber Dam	66	1	Vanderbilt	−22	30	1.59	−.49	Painesdale	5.09	Lake City	.48
Minnesota	11.8	−3.7	4 stations	45	12	2 stations	−40	26	.95	+.16	Reads	2.60	Willmar	.24
Mississippi	47.8	−.6	5 stations	80	[1] 30	do	12	[1] 11	4.53	−.81	Rosedale	7.29	Pontotoc	1.53
Missouri	31.6	−2.5	Garber	69	28	Downing	−3	26	1.66	−.41	Campbell	4.12	Unionville	.05
Montana	24.0	+1.1	Grass Range	67	11	Medicine Lake	−40	26	.91	+.02	Haugan	6.83	Four Buttes	.03

[1] Other dates also.